InfraStruXure™ InRow SC

Air-Cooled Self-Contained- 50/60Hz

Technical Data

Contents

Overview 1

InRow SC System Overview 2

Application Guidelines 3

Standard Features 4

Optional Features 5

Microprocessor Controller 6

Components 7

Air-cooled Performance Specifications 9

General Technical Specifications 10

Electrical Data 11

Sound Performance Data 12

Dimensional Data 13

Mechanical Connections 14

Guidelines for Installation 15

Guide Specifications 17

Overview

The InRow SC offers efficient, effective and economical cooling for a variety of wiring closets and server room spaces.

- Computer rooms
- Wiring Closets
- Telecommunication facilities
- Power equipment
- Medical equipment rooms
- LAN/WAN environments

A worldwide network of APC representatives is fully qualified to provide engineering, sales, installation and service for our products.

APC warrants all parts for 12 months from date of shipment. Extended warranties are available.

Capacity

The InRow SC self contained configuration is available in a nominal capacity of 5kW with extended capacity of up to 7kW when used in conjunction with RACS (Rack Air Containment System) or elevated return temperatures.

Configuration

- Self Contained Air-cooled

In-row Advantages

The In-row solution improves energy efficiency and cooling ability in a number of ways. First, the room air is pulled in through a filter at the rear of the unit, is cooled, and is then distributed out the front of the unit to cool the space. Air from outside the room is utilized for rejecting heat for cooling by the building AC system. Removing and neutralizing the heat from the hot aisle provides for a more efficient return air path than placing the air conditioner along the perimeter. The cold air is then supplied to the area in front of the racks, exactly where it is needed.

Regulatory Approvals

- CE Compliant
- UL Listed
- IEC Certified
- BSMI
- EN 55022 Class A
- FCC Part 15 Class A
- ICES-003
- VCCI
- VDE

Standard Features

- Variable Speed Direct Drive Tubeaxial Fans
- Insulated Side Panels
- Evaporator Coil
- Condenser Coil
- Compressor
- Condensate Pump
- Condensate Pan
- Electronic Hot Gas Bypass Valve
- Single Cord Power Supply
- Microprocessor Controller
- Network Management Card
- High Head Pressure Protection
- Rack Inlet Temperature Control
- Remote Shutdown
- Dual Fan Power Supply
- Input/Output Contacts- Alarms
- Washable Filters
- Condenser Ducting Kit
- SX Rack Baying Kit

Optional Features

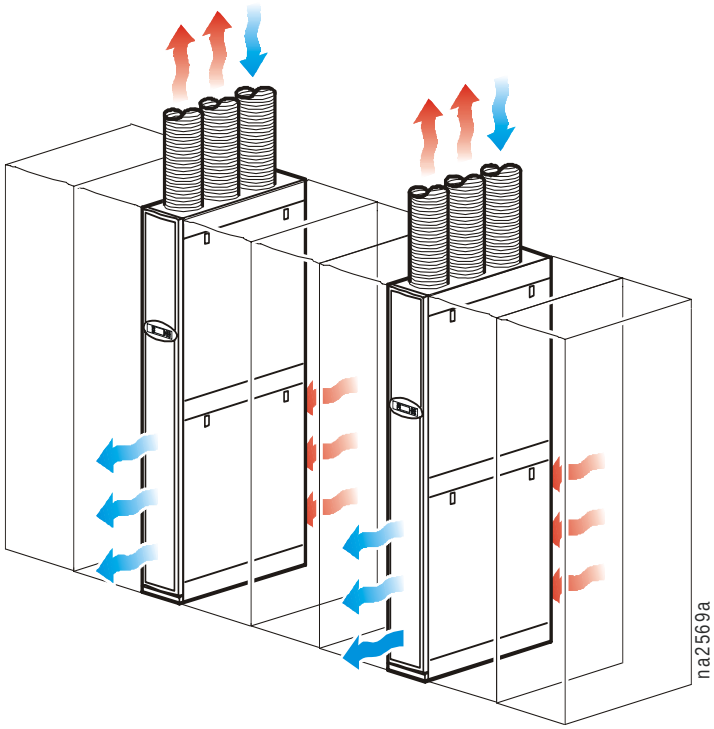
- Rope Water Detector
- Cable Support Bridge Trough
- VX Rack Baying Kit

InRow SC System Overview

Self Contained System

An air-cooled self-contained system has all the refrigerant system components located in a single enclosure. The unit is pre-charged from the factory and requires no field installed refrigerant lines or remote heat exchangers. Heat is rejected to a building return plenum via the ducting kit designed to connect to a standard drop ceiling.

- No specialized skills or trades required for installation
- Factory sealed and tested system
- Rapidly deployable
- Low maintenance



Application Guidelines

Self-Contained System

The InfraStruXure InRow SC self-contained unit is designed to be placed in-row, between equipment racks for cooling-only applications. The unit has a nominal cooling capacity of 5kW and is intended to provide dedicated cooling for wiring closets, server rooms and small data centers that have a drop ceiling as part of the building return plenum. The unit is designed for very high sensible heat ratio cooling.

In order for the unit to operate properly, the following mechanical requirements must be met on a 24x7 basis:

- Provide at least 850 CFM (1440 m^3/hr) of airflow to and from the condenser of each unit deployed
- Condenser inlet air temperatures must be between 32-105°F (0-40°C)
- Heat rejected by condenser, up to 10kW per unit, must be treated by the building cooling system
- Provide condensate drain connection
- Provide adequate clearances for airflow, maintenance service

The InRow SC is compatible with the Rack Air Containment System (RACS) and can be used to isolate the heat load from individual racks. When combined with front and rear containment, the nominal cooling capacity is up to 7kW for the 60 Hz unit (and up to 6.3kW for 50 Hz unit). Minimum load requirements must also be observed to prevent the compressor from cycling off. If the compressor cycles off, there is a minimum off time period of 2-minutes where no cooling is provided and the desired rack inlet temperatures may be exceeded. RACS is not designed to protect the SC unit or IT equipment from harsh, corrosive or dirty environments.

- Minimum recommended heat load is 3kW per SC unit, depending on room conditions
- Configurations include rear containment only or front and rear containment

Further Reading

For additional guidance regarding the InRow SC refer to the following application notes and white papers:

- AN-90 Rack Air Containment Configurations for InRow Cooling Units
- AN-109 Application Guidelines for the InfraStruXure InRow SC Condenser
- AN-112 Best Practices for Deploying the InfraStruXure InRow SC
- AN-113 Configuration Types and Sequence of Operations for the InfraStruXure InRow SC
- AN-114 Guidelines for Using Rack Air Containment System with InfraStruXure InRow SC
- AN-115 UPS Power for the InfraStruXure InRow SC
- WP-68 Cooling Strategies for IT Wiring Closets and Small Rooms
- WP-130 The Advantages of Row and Rack-Oriented Cooling Architectures for Data Centers

Standard Features

Variable Speed Direct Drive Tubeaxial Fans

Each unit is equipped with six 200mm mixed flow, direct drive, tubeaxial DC fans. Three of the fans blow air across the condenser coil to provide heat rejection from the refrigerant system. In order to provide uniform airflow across the evaporator coil, the remaining three fans draw air through the evaporator section. The evaporator fans can be easily replaced while the unit is in operation. All fans are variable speed, allowing them to assist in modulating unit cooling capacity and maintaining refrigerant head pressure.

Insulated Side Panels

POWDER COATED TOUGH™

The frame is constructed of 16 gauge formed steel for maximum strength. All exterior panels and corner posts on the frame are powder coated for durability and an attractive finish. Front and rear exterior panels are constructed of 18 gauge perforated steel with 69.5% open free area. Insulation is 5 lb/ft^3 (80.1 kg/m) density and complies with ASTM E84 rating of 25/50.

Condensate Pump

Removes condensate from the system to ensure continuous operation. The factory installed and wired condensate pump is capable of pumping 1.3g/hr (5.9l/hr) against head pressures of up to 50ft (15.2m) of total run, of that 16ft (4.9m) can be vertical lift.

Condensate Pan

Condensate Pan is fabricated from V-0 polymeric materials and is thermal formed, provided with antifungal additives, and is a non-ferrous material for higher indoor air quality.

Electronic Hot Gas Bypass

An electronically controlled hot gas bypass valve directs hot discharge gas from the compressor back to the expansion valve and into the coil. During lightly loaded conditions, compressor cycling is reduced and prevents the evaporator coil from freezing. Hot gas bypass also assists in the management of the refrigerant head pressure.

Single Cord Power Supply

The 60hz unit utilize a NEMA L6-20 plug, the 50hz unit uses an IEC 309 16A plug. The power cord can be connected to the power feed either through the top or bottom of the unit.

Network Management Card

Permits multi-level access to monitoring, control, and event notification features over the user's network. Also allows the InRow SC to be integrated into APC's InfraStruXure Manager device.

High Head Pressure Protection

The condenser fans modulate to maintain a nominal refrigerant discharge of 425 PSIG (6.9kPa). If the condenser inlet air is restricted or too warm, the refrigerant discharge pressure will rise forcing the condenser fans to increase speed to 100%. To prevent a total loss of cooling, the unit will slow evaporator fans and begin to activate the hot gas bypass valve to reduce system capacity. If the discharge pressure continues to rise, the unit will shut down in order to prevent unit damage.

Rack Inlet Temperature Control

To control the unit based on rack inlet temperature, a remote sensor is provided. This sensor is factory wired for a remote placement in the field on adjacent IT racks.

Remote Shutdown/IO Contacts

The unit provides one field connection input for remote shutdown. I/O contacts allow for remote annunciation of any alarm condition or critical only alarms.

Dual Fan Power Supply

The unit includes 2 power supplies, each capable of running all fans at 80% capacity in the event of a single power supply failure. Individual power supplies are hot swappable.

Washable Filters

The filtration of conditioned air is extremely vital to maintaining the clean, particle-free environment required by electrical equipment. Filters are <20% efficient (ASHRAE 52.1) and MERV 1 (ASHRAE 52.2) rated that meets HF-1 standards for electronics.

Ducting Kit w/Ceiling Adapter

60Hz units have a 24in x 24in adapter, 50Hz units have a 600mm x 600mm adapter. Each duct tube is 6 ft. (1.8m) long and 10in (254mm) in diameter. Three ducts are provided, one for the condenser supply and two for the condenser exhaust. Mounting hardware is provided to attach ducts to the ceiling adapter.

SX Rack Baying Kit

Baying kit enables the cooling system to be bayed to the APC Netshelter SX enclosures. Kit is made of 16 gauge steel.

Optional Features

Rope Water Detectors

The solid-state spot water detector activates an audible alarm on the controller when moisture is detected, providing protection along a 20ft (6.1m) length. A maximum of four detectors can be installed in series, for a total of 80ft (24.4m).

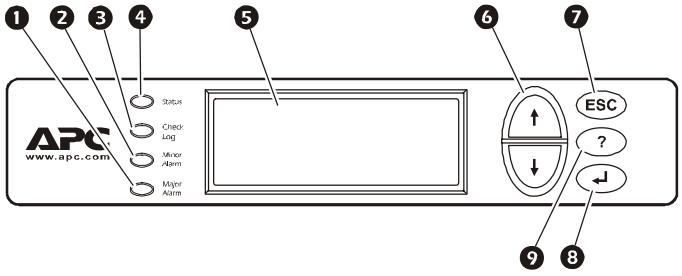
Cable Support Bridge Trough

Organizes cables over the top of the unit without interfering with the duct tubes. The bridge trough is mounted to the racks, which allows the InRow SC to be moved without having to disconnect any of the overhead cabling. Up to 80 CAT5 cables can fit inside the bridge trough.

VX Rack Baying Kit

Baying kit enables the cooling system to be bayed to the APC Netshelter VX Rack Enclosures. Kit is made of 16 gauge powder coated steel.

Microprocessor Controller



❶	Critical Alarm LED
❷	Warning Alarm LED
❸	Check Log LED
❹	Status LED
❺	Liquid Crystal Display (LCD)
❻	Up and Down Arrow Keys
❼	ESC key
❽	Enter key
❾	Help key

Microprocessor Controller

The microprocessor controller is standard on each system. The controller provides precision control for the demanding requirements of:

- Data centers
- Server rooms
- Wiring closets
- Switch rooms
- UPS rooms

Open Architecture

The NetworkAIR SC protocol is open for integration with all building management systems. Communication interface on the system is MODBUS RS485.

Control Type

Controller utilizes proportional and integral derivative (PID), a time proven precision environmental control method. The PID is non-adjustable, and can not be customer configured.

Control

The backlit, four-line by twenty character display is password configurable.

Functions

- Supply and Return Air Temperatures
- Operational Mode Control
- Event Logging
- Alarms
- Fan Speed Adjustment
- Input/Output Module Programming
- Refrigerant Discharge and Suction Pressure
- Suction Line Temperature

Logging

The microprocessor displays the 30 most recent alarms. Each alarm log contains a time/date stamp as well as operating conditions at the time of occurrence. The controller also displays run time, in hours, for major components (Air Filter, Condenser Fans, Evaporator Fans, Compressor, Condensate Pump, Fan Power Supplies).

Factory Default Set Points:

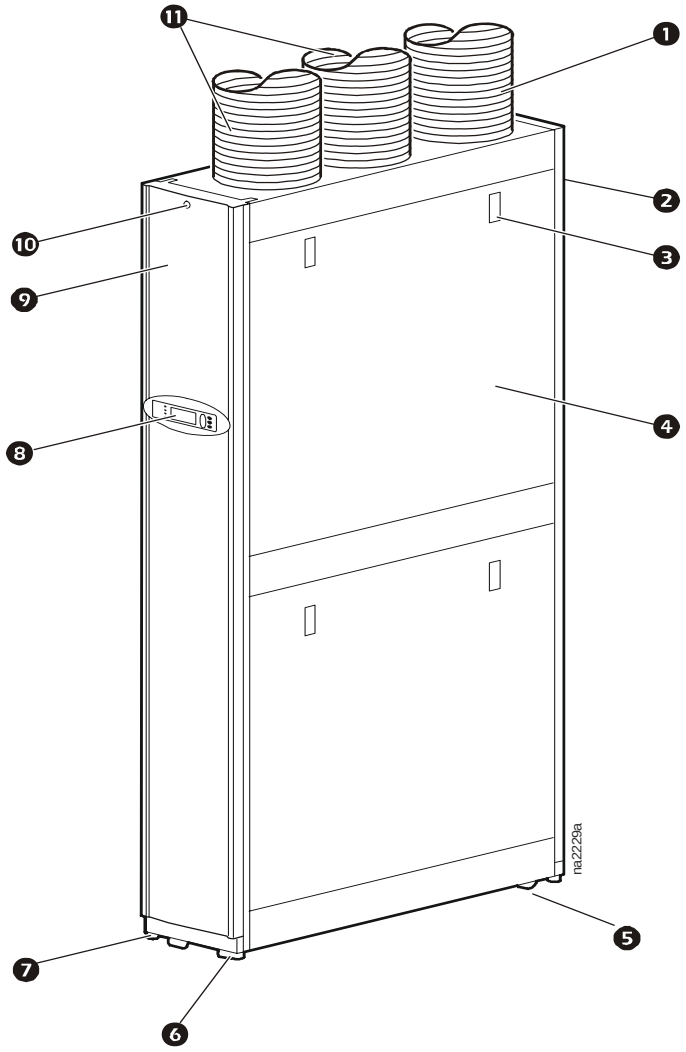
- Cool: 72.0°F (22.2°C)
- Deadband: 1.8°F (1.0°C)
- Supply Air InRow: 64.0°F (17.8°C)
- Supply Air RACS: 64.0°F (17.8°C)
- Supply Air Spot: 57.0°F (13.9°C)

Alarms

- Air Filter Clogged
- Air Filter Run Hours Violation
- Condensate Pump Full Fault
- Condenser Fan #n Fault
- Cooling Failure
- Persistent High Discharge/Low Suction Pressure Alarm
- Rack Inlet High Temperature Violation/Fault
- Suction Pressure Sensor/ Temperature Fault
- Supply Air High Temperature Violation
- Upper Return/Supply Air Sensor Fault
- Water Detection Fault
- Discharge Pressure Sensor Fault
- Evaporator Fan #n Fault
- External Communication Fault
- Fan Power Supply Left/Right Fault
- Filter Sensor Fault
- High Discharge Pressure Alarm
- Internal Communication Fault
- Lower Return/Supply Air Sensor Fault
- Low Suction Pressure Alarm
- On Standby: Input Contact Fault

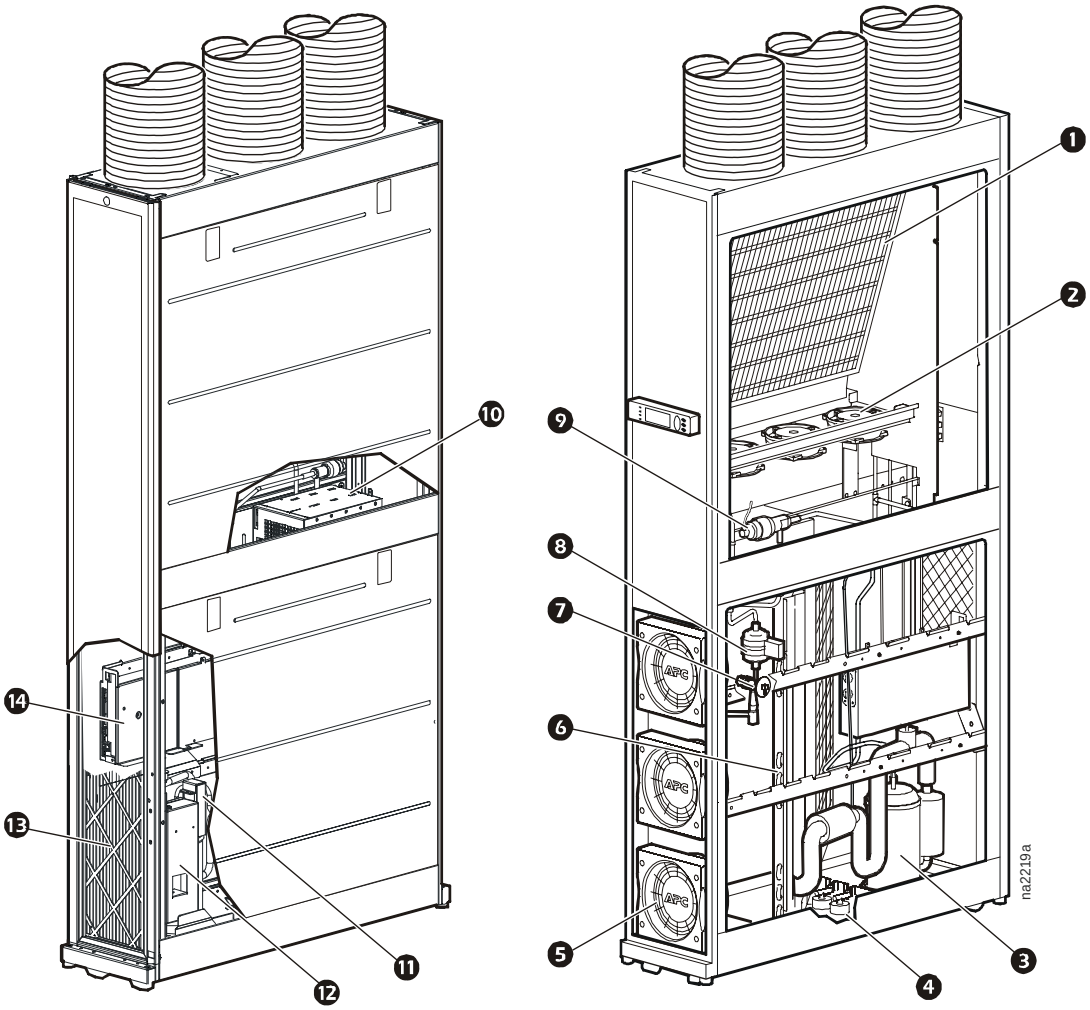
Components

External View



1. Intake Air Duct
2. Removable Rear Door
3. Side Panel Latch/Lock
4. Removable Side Panel
5. Rear Casters (Non-swiveling)
6. Front Casters (Swiveling)
7. Adjustable Leveling Foot (4 places)
8. Display Interface
9. Removable Front Door
10. Door Lock
11. Exhaust Air Duct

Internal View



1. Condenser Coil
2. Condenser Fans
3. Compressor
4. Condensate Pan Floats
5. Evaporator Fans
6. Evaporator Coil
7. Thermostatic Expansion Valve
8. Refrigeration Filter Drier
9. Hot Gas Bypass Valve
10. Power Supply
11. Condensate Pump
12. High Voltage Box
13. Washable 1/2in Air Filter
14. User Interface Box

Air-cooled Performance Specifications

NET COOLING CAPACITY		
Model	**ACSC100**	**ACSC101**
ELECTRICAL INPUT	200-240V, 1ph, 60Hz	200-240V, 1ph, 50Hz
70°F DB, 58.5°F WB (21.1°C DB, 14.7°C WB)		
Total - BTU/hr (Watts)	16300 (4770)	15100 (4410)
Sensible - BTU/hr (Watts)	15100 (4440)	14300 (4200)
72°F DB, 60.0°F WB (22.2°C DB, 15.6°C WB)		
Total - BTU/hr (Watts)	17000 (4980)	15400 (4510)
Sensible - BTU/hr (Watts)	15500 (4530)	14400 (4230)
75°F DB, 61.0°F WB (23.9°C DB, 16.1°C WB)		
Total - BTU/hr (Watts)	16700 (4890)	16200 (4740)
Sensible - BTU/hr (Watts)	16200 (4740)	15900 (4650)
80°F DB, 67.0°F WB (26.7°C DB, 19.4°C WB)		
Total - BTU/hr (Watts)	18100 (5310)	18000 (5250)
Sensible - BTU/hr (Watts)	15500 (4560)	16000 (4680)
80°F DB, 62.5°F WB (26.7°C DB, 16.9°C WB)		
Total - BTU/hr (Watts)	17200 (5040)	16700 (4890)
Sensible - BTU/hr (Watts)	17200 (5040)	16700 (4890)
85°F DB, 65.0°F WB (29.4°C DB, 18.3°C WB)*		
Total - BTU/hr (Watts)	18000 (5250)	16700 (4890)
Sensible - BTU/hr (Watts)	18000 (5250)	16700 (4890)
95°F DB, 82.7°F WB (35.0°C DB, 28.2°C WB)**		
Total - BTU/hr (Watts)	22000 (6450)	21300 (6240)
Sensible - BTU/hr (Watts)	11300 (3300)	11300 (3300)
96°F DB, 68°F WB (35.5°C DB, 20°C WB)***		
Total - BTU/hr (Watts)	22200 (6500)	19800 (5800)
Sensible - BTU/hr (Watts)	22200 (6500)	19800 (5800)

Note: All values are accurate to +/- 5% and based on full fan speed with standard filters and 95ºF (35ºC) Condenser entering air
All tests were performed at 100% evaporator fan speed except as noted. Net cooling data is published above.
*Airflow reduced to 1000 CFM (1700 m^3/hr) at this condition to maintain appropriate suction temperature
**Airflow reduced to 600 CFM (1020 m^3/hr) at this condition to maintain appropriate suction temperature
***Airflow reduced to 850 CFM (1440 m^3/hr) to maintain appropriate suction temperature. Represents conditions with front and rear containment

Altitude Correction Factors for InRow Products											
Altitude (ft)	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
Specific Volume	13.58	14.09	14.62	15.18	15.76	16.36	17.00	17.67	18.37	19.11	19.89
Density lb/ft^3	0.074	0.071	0.068	0.066	0.063	0.061	0.059	0.057	0.054	0.052	0.050
Density Ratio	1.000	0.964	0.929	0.895	0.862	0.830	0.799	0.769	0.739	0.711	0.683
Capacity Correction	1.00	0.981	0.962	0.933	0.913	0.884	0.865	0.846	0.826	0.807	0.787

Note: Room condition 72ºF db/50% RH.
Density ratio is used for air flow correction factor. Capacity correction is used for performance derate

General Technical Specifications

MODEL	ACSC100	ACSC101
ELECTRICAL INPUT	200-240V, 1ph, 60Hz	200-240V, 1ph, 50Hz
AIR SYSTEM - Direct Drive Tubeaxial Fans*		
Maximum Evaporator Airflow - CFM (m^3/hr)	1200 (2038)	
Minimum Evaporator Airflow - CFM (m^3/hr)	400 (679)	
Maximum Condenser Airflow - CFM (m^3/hr)	850 (1440)	
Minimum Condenser Airflow - CFM (m^3/hr)	300 (509)	
REFRIGERANT		
R410A - oz (kg)	52 (1.47)	
Maximum Total Heat of Rejection BTU/hr (Watts)	34000 (10000)	29700 (8700)
EVAPORATOR COIL - COPPER TUBE/ALUMINUM FIN		
Face Area - ft^2 (m^2)	2.5 (0.23)	
Rows Deep	2	
Face Velocity - FPM (m/s)	380 (2.44)	
FILTERS		
Quantity	1	
Size - in (mm)	9.375 X 36.75 (238 X 933)	
Depth - in (mm)	1/2 (13)	
Efficiency- ASHRAE 52.1 (ASHRAE 52.2)	<20% (MERV 1)	
PHYSCIAL DATA - UNIT		
Weight - lbs (kg)	365 (165.9)	
Height - in (mm)	78.4 (1991)	
Width - in (mm)	11.8 (300)	
Depth - in (mm)	42.1 (1069)	
PHYSICAL DATA - CONDENSER DUCT TUBES		
Length - ft (m)	6 (1.8)	
Diameter - in (mm)	10 (254)	
CONNECTION SIZES - CONDENSATE DRAIN		
Drain Line ID - in (mm)	3/16 (4.76)	

Note: *Airflow automatically varies depending upon operating conditions

Electrical Data

SKU	Rated						In-Rush***			Plug Type
	Voltage (Volts)	Phase	Frequency (Hz)	Current* (Amps)	Power** (Watts)	Power Factor	Duration (ms)	Peak Current (Amps)	Power (Watts)	
ACSC100	208-230	1	60	16.0	2940	0.98	200	56.0	8240	
ACSC101	220-240	1	50	14.4	2390	0.98	60	65.0	10100	

Note: *Rated Current is the maximum current draw for the input voltage range
**Rated Power is maximum power consumption expected during normal operations, actual power draw may vary based upon operating conditions
***In-Rush is of short duration and only occurs during start-up and compressor cycling.

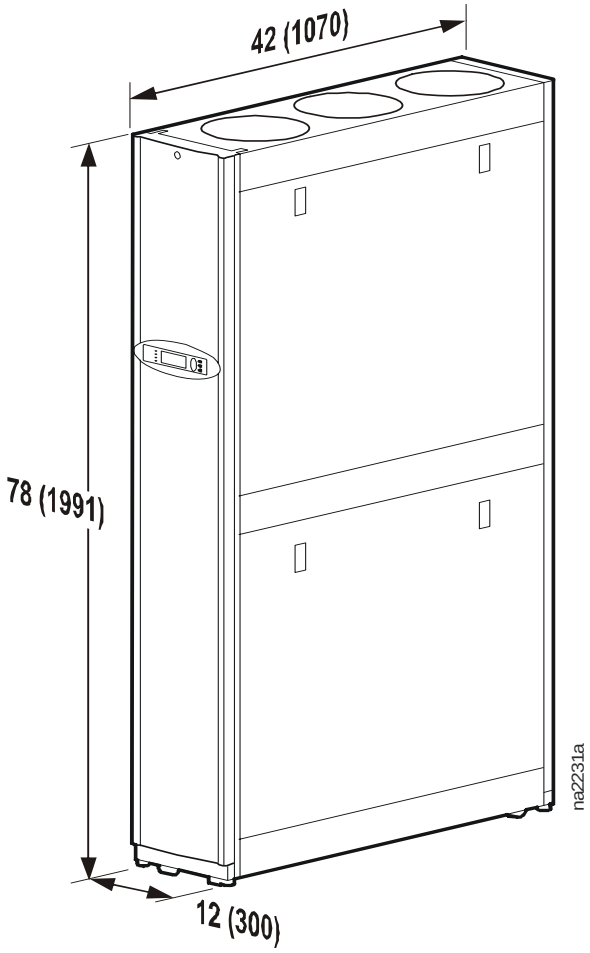
Sound Performance Data

Air-Cooled Tested Sound Data										
Fan Speed%	Evaporator Air-flow Rate (SCFM)	Octave Band Hz, Sound Power dB re 10^{-12}Watts. Data obtained from Reverberation Sound Tests in accordance with ANSI S12.51-2202, ISO 3741-1999							**Sound Power (dBA)**	Lp Sound Pressure dB re: 20 microPa*
		125	**250**	**500**	**1000**	**2000**	**4000**	**8000**		dBA
EvF 100% CondF 100%	1180	77.5	86.5	86.5	83.0	78.0	75.5	70.5	87.7	82.2
EvF 90% CondF 100%	1080	77.5	86.5	85.5	81.0	76.0	73.5	68.0	86.4	81.0
EvF 80% CondF 100%	960	82.0	86.5	85.5	79.5	75.5	70.5	65.5	85.7	80.5
EvF 60% CondF 80%	810	74.5	87.0	79.5	78.5	73.0	66.5	62.5	83.9	78.1

Note: Abbreviations EvF and CondF stand for evaporator fan and condenser fan respectively
*Weighted Sound Pressure dBA in a 10ft x 10ft x 10ft room at 5 ft distance
Sound data verified by testing at NRTL

Dimensional Data

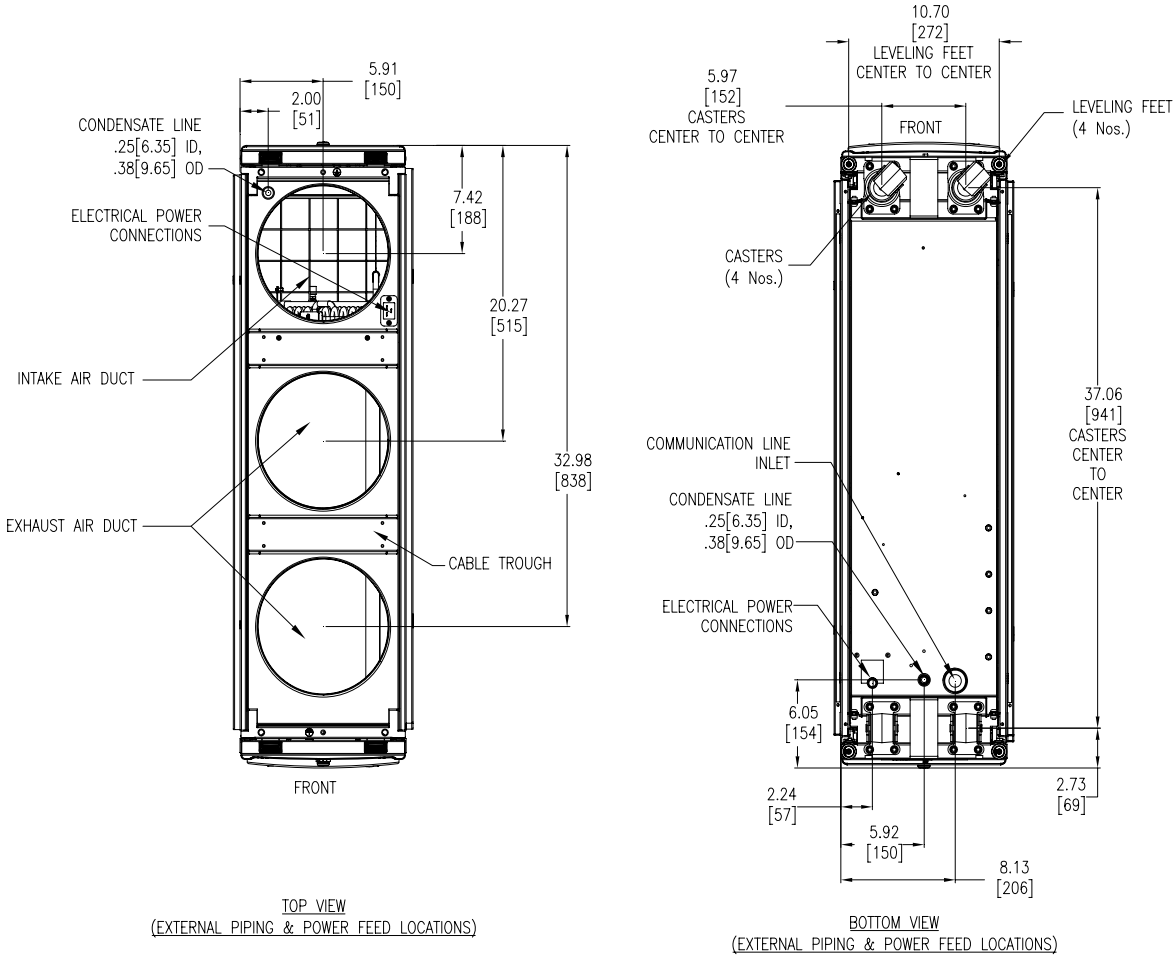
InRow SC Assembled Module



Dimensions are inches (millimeters)

Mechanical Connections

InRow SC Condensate Line and Power Connections



Dimensions are inches (millimeters)

Note: For more detailed information, please refer to submittal drawings

Guidelines for Installation

The InRow SC provides reliable, self-contained cooling that maximizes availability within small IT rooms and wiring closets. The unit incorporates the latest system design innovations to provide you with optimum efficiency, reliability and rapid installation.

For more detailed information, see the InRow SC Installation manual (990-2796).

For locations with seismic installation requirements, additional information regarding anchorage selection is provided in the InRow SC Seismic Installation Manual addendum (990-3063).

Room preparation

During the design of the data center, consider ease of entry for the equipment, floor loading factors, and accessibility to ducting and wiring.

Ensure the room is insulated to minimize the influence of exterior heat loads. Use the minimum required amount of fresh air for make up to comply with local and national codes and regulations.

The room must be sealed with a vapor barrier to minimize migration of moisture. Polyethylene film (plastic sheeting) is a good vapor barrier for ceiling and wall applications. Rubber, or plastic-based paints, should be applied to concrete floors and walls. The room should be thoroughly insulated to minimize thermal loads and make-up air (if required) should be pre-conditioned to reduce additional temperature, filtration, and moisture loads.

The room should have a drop ceiling that is part of the building HVAC system. The plenum should be at least 12in (300mm) deep and provide adequate airflow for each unit supported. The HVAC system must be capable of rejecting up to 34000 BTU/hr (10kW) of heat per unit. Refer to Application Note AN-109 and the InRow SC Installation manual for additional information.

Receiving the unit

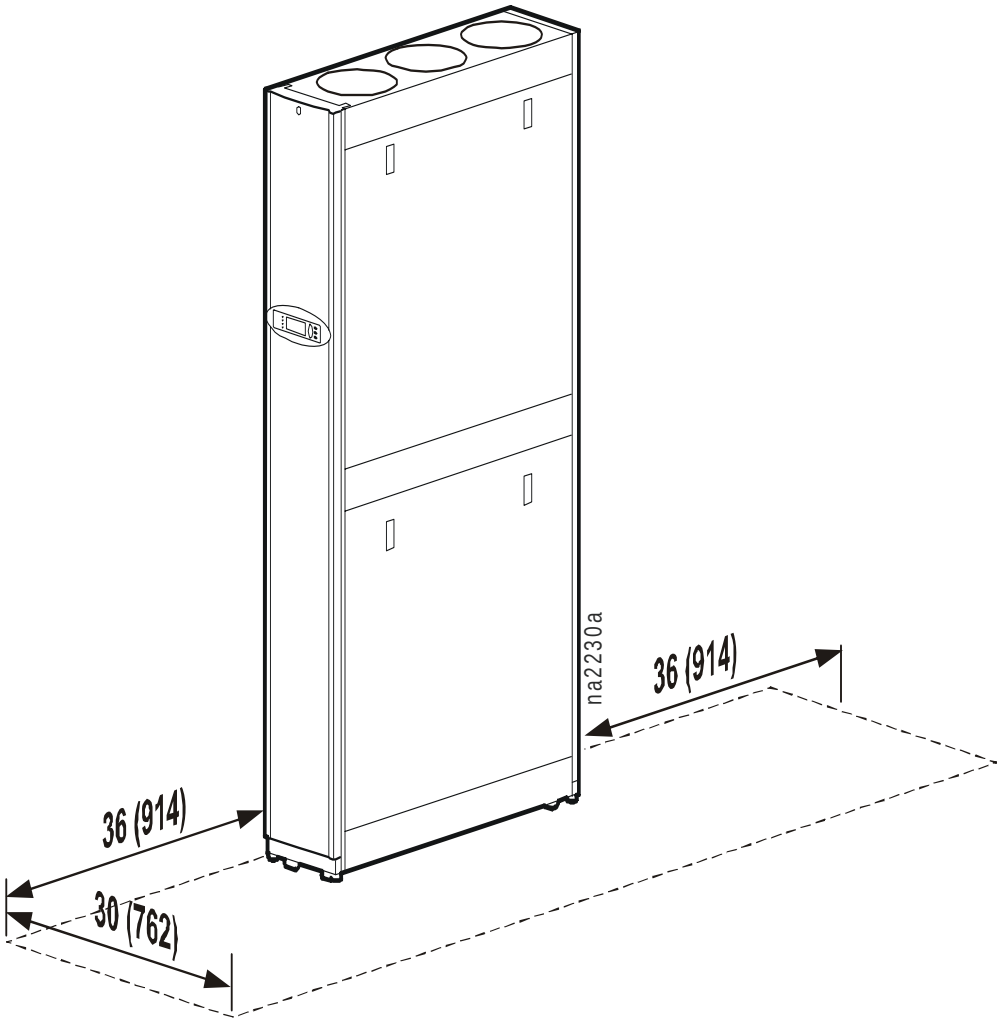
Your InRow SC unit has been factory tested and inspected prior to shipment. To ensure that you have received the unit in excellent condition, perform a careful inspection of the crating and the unit immediately upon receipt. Verify that all parts ordered were received. Report any damage discovered to the freight carrier. If necessary, contact the APC technical service department at 1-888-695-6500 for help in repairing or replacing damaged parts. While APC is not responsible for damage incurred in transit, we want to make sure that you have no undue delays in your system start-up.

Rigging

The unit is manufactured with a formed steel frame for maximum strength and unit integrity. However, as with all electrical and mechanical equipment, you must take care with proper rigging of your unit. The equipment is easily tipped over. Use extreme caution when unpacking and moving. When using a forklift, move the unit on the shipping pallet only. When moving the equipment on a ramp, always point the narrow width in the direction of travel. Do not place the equipment on its side. If the equipment has been tilted, place it upright on a flat, solid surface and keep in this position for at least 24 hours before operating. For more detailed information, refer to the APC Receiving and Unpacking manual (990-2795A).

Service Access

Routine service and basic repair activities can be accomplished with front and rear access only. APC recommends 36ft (914mm) of clear floor space in front and back of the unit for this purpose. For major repair activities needing side access, 30ft (762mm) of clear space should be provided as needed. At least 42ft (1070mm) of clear space is required to free the unit from the row of rack enclosures.



Dimensions are inches (millimeters)

Guide Specifications

Standard Components

A. CABINET CONSTRUCTION

1. Exterior panels shall be 18 gauge metal with 5 lb/ft^3 (80 kg/m^3) density foam insulation. Insulation complies with UL94-5VA ASTM E84 flame spread and smoke developed rating of 25/50. Front and rear exterior panels shall be 18 gauge perforated steel with 69.5% open free area, and equipped with a keyed lock to provide a means of securing access to the internal components of the unit.
2. The frame shall be constructed of 16 gauge formed steel welded for maximum strength. All units shall provide full service from the front and rear, allowing units to be placed within a row of racks.
3. All exterior panels and frame shall be powder coated for durability and attractive finish. Exterior frame and panel color shall have color values: L = 74.50, a = -.53, b = +8.20.
4. Units shall include casters and leveling feet to allow ease of installation in the row and provide a means to level the equipment with adjacent IT racks.

B. VARIABLE SPEED DIRECT DRIVE MIXED FLOW DC FAN ASSEMBLY

1. Fan: The unit shall be configured for draw-through air pattern to provide uniform air flow over the entire face of the coil. Each unit shall include six 200 mm mixed flow direct drive DC axial fans. Three fan assemblies shall be designed to provide 400 CFM (680 m^3/hr) each across the evaporator coil for total unit airflow of 1200 CFM (2039 m^3/hr). Three fan assemblies shall be designed to provide 283 CFM (480 m^3/hr) each across the condenser coil for total unit airflow of 850 CFM (1440 m^3/hr).
2. Variable Speed Fans: Fans shall be variable speed capable of modulating from 30-100%. Fans shall soft start to minimize in-rush current when starting.
3. Fan Protection: Each evaporator fan assembly shall consist of a plastic injection molded bezel with integral fan discharge finger guard. Inlet of the fan should include a cage type finger guard.
4. Operation and Service: The unit should be capable of operation in the event of a fan failure. Evaporator fans shall be replaceable while the unit is in operation.

C. POWER SUPPLY

1. Input Power Feed: Single power input should be a locking NEMA or IEC plug connection suitable for the input power selected. Unit power consumption is not to exceed 2950 watts during normal operation.
2. Fan Power Supplies: Dual internal DC power supplies are capable of running all fans at 80% capacity in the event of a power supply failure. Power supplies shall be hot-swappable.

D. MICROPROCESSOR CONTROLLER

1. Monitoring and Configuration: The master display shall allow monitoring and configuration of the air conditioning unit through a menu-based control. Functions include status reporting, set-up, and temperature set points. Four LEDs report the operational status of the connected air conditioning unit.
2. Controls: The microprocessor controller shall come equipped with control keys to allow the user to navigate between menus, select items, and input alpha numeric information.
3. Alarms: The microprocessor controller shall activate a visible and audible alarm in the occurrence of the following events:
   a. Air Containment Pressure Sensor Fault
   b. Air Filter Clogged
   c. Air Filter Run Hours Violation
   d. Condensate Pan Full Fault
   e. Condensate Pump Fault
   f. Condenser Fan #n Fault
   g. Cooling Failure
   h. Discharge Pressure Sensor Fault
   i. Evaporator Fan #n Fault
   j. External Communication Fault
   k. Fan Power Supply Left Fault
   l. Fan Power Supply Right Fault
   m. Filter Sensor Fault
   n. High Discharge Pressure Alarm
   o. Internal Communication Fault
   p. Lower Return Air Sensor Fault
   q. Lower Supply Air Sensor Fault
   r. Low Suction Pressure Alarm
   s. On Standby: Input Contact Fault
   t. Persistent High Discharge Pressure Alarm
   u. Persistent Low Suction Pressure Alarm
   v. Rack Inlet High Temperature Violation
   w. Rack Inlet Temperature Sensor Fault
   x. Return Air High Temperature Violation
   y. Suction Pressure Sensor Fault
   z. Suction Temperature Sensor Fault
   aa. Supply Air High Temperature Violation
   ab. Upper Return Air Sensor Fault
   ac. Upper Supply Air Sensor Fault
   ad. Water Detection Fault

4. Logging: The microprocessor controller shall log and display all available events. Each alarm log shall contain time/date stamp as well as operating conditions at the time of occurrence. Controller shall display the run time hours for major components.

E. NETWORK MANAGEMENT CARD

The unit shall include a network management card to provide management through a computer network through TCP/IP. Management through the network should include the ability to change set points as well as view and clear alarms.

F. EVAPORATOR AND CONDENSER COIL

Coil shall use raised lance with rippled edge type aluminum fin and 0.375in OD rifled copper tube coils with 0.012in wall thickness. Coil end supports shall be a minimum 18 gauge G90 galvanized steel.

G. CONDENSATE PAN

Drain pan shall include a condensate pump and dual floats for control and overflow protection. Condensate pans are V-0 thermal formed, anti-fungal, non-ferrous material for higher indoor air quality.

H. CONDENSATE PUMP

Factory installed and wired condensate pump shall pump 1.3 gal/h (4.9 liters/hour) at 16ft (4.9m) of vertical lift and a 50ft (15.2m) horizontal run.

I. FILTERS

Standard air filter: <20% efficient per ASHRAE 52.1, MERV 1 per ASHRAE 52.2, 1/2in washable mesh filter.

J. REMOTE TEMPERATURE SENSOR

Remote temperature sensor shall be shipped factory wired to the unit for placement in the field to provide control input based on rack inlet temperature. Length is 14ft.

K. HOT GAS BYPASS

The unit shall use an electronic stepper valve for hot gas bypass operation. The actuator will have 1596 steps from fully open to fully closed. The discharge gas will be piped to the unit thermostatic expansion valve.

L. DUCTING KIT

Ducting kit with ceiling tile adapter is included with the unit. Duct tubes shall be 10in (254mm) in diameter and 6ft (1.8m) long and constructed from UL 181 Class I material.

Ceiling tile adapter shall be suitable for either 24in x 24in or 600mm x 600mm suspended ceiling grids and constructed of powder coated metal.

M. CABLE WATER DETECTORS (OPTIONAL)

1. A leak detection sensing cable shall be shipped loose with the unit. If water or other conductive liquids contact the cable anywhere along its length, the main controller visually and audibly annunciates an alarm.
2. The detector shall be provided with a 20ft (6.1m) of cable. Additional cable may be cascaded up to 80ft (24.4m) total length. A total of four water detectors are available per unit.

N. CABLE SUPPORT BRIDGE TROUGH (OPTIONAL)

Overhead cable distribution bridge shall connect to adjacent racks and allow for removal of the unit without disrupting the cable connections. The trough shall be made of 16 gauge metal with powder coat finish. Trough shall be capable of carrying no less than 80 CAT5 cables.

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